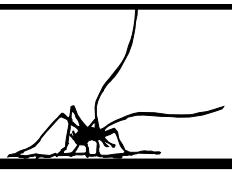
The Trog Log



MAMMOTH CAVE NATIONAL PARK'S ENVIRONMENTAL EDUCATION NEWSLETTER

Spring
2000

A Letter from the Mammoth Cave National Park Environmental Education Coordinator

Dear Fellow Educator:

Welcome to the first edition of the *Trog Log*. During a brainstorming session in the Environmental Education office at Mammoth Cave National Park the staff decided that we really needed a better way to communicate with teachers. Thus the seed was planted for the *Trog Log*.

Through this biannual publication we hope to keep you abreast of the latest "happenings" with our staff and about our program in general. See the back of the newsletter for the latest changes.

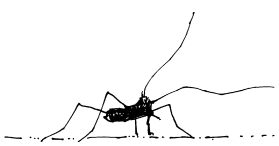
One item that I would like to inform you about is our summer workshops. We have four scheduled: **June 22**—a workshop for 4/5th grade teachers; **June 29**—a karst and groundwater workshop for grades 4-12 cosponsored by the American Cave and Conservation Association and Mammoth Cave National Park; **July 20**—a workshop for primary teachers, including an introduction to our traveling trunk; and **July 27**—a workshop to introduce our latest curriculum, paleontology, for teachers in grades 1-12. (For a sneak peak, see the next page!) Hopefully, you have already seen the flyers that were mailed to your schools earlier. If not, call our office at (270)758-2354 and we will be happy to tell you all about what we have to offer in these sessions.

This publication is actually for you. If you have suggestions on something you believe would make it better or that we should include—let us know. One thing we have learned about the field of education is that flexibility is a must and change is inevitable. Since this is our first edition we would love to hear your comments.

Have a great Summer!!

Sharon Ganci
Education Specialist
Mammoth Cave National Park

Why the "Trog Log?" Trogloxenes are animals that spend a part of their lives in caves, but come out for food and adventure. Students spend most of their time in the classroom, but when they extend their classroom to include the outdoors, nourishment for the mind abounds!



Inside:

Welcome to Our Newsletter!

Mammoth Cave National Park has been working with area schools for many years now, providing exciting extended classroom opportunities to teachers and students. As these opportunities continue to change and grow we want to make sure that you know about them!

We hope that we will be able to distribute this newsletter on a biannual basis, updating you regularly about the goings-on in Mammoth Cave's EE office. Each issue will contain information about current events in our office and the park, stories about programs we are doing with local schools, a lesson for you to use with your class, and more!

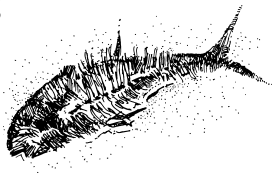
As we consider our program a partnership between our schools and the park, we want you to be a part of this newsletter as well. Please send us your lesson ideas, your questions, or samples of student writing and artwork relating to Mammoth Cave. If you have other ideas you think should be included in the newsletter, let us know!

The Trog Log *is produced by the Environmental Education Program at Mammoth Cave National Park. Please contact us with any questions, comments, or suggestions. Sharon Ganci, Heather Boothe, Cheryl Messenger, John McKay, and Zona Cetera, Mammoth Cave National Park, P.O. Box 7, Mammoth Cave, KY 42259; by telephone at (270) 758-2354 or (270) 758-2313; by fax at (270) 758-2349; or by e-mail: MACA_Environmental_Ed@nps.gov.*

From our new Paleontology Curriculum Guide:

Kitchen Geology

GRADE LEVEL: 4-6 **TIME REQUIRED:** Two to three class periods
GOAL: To create a layered edible dish that demonstrates: 1) the layering of rock strata, and 2) the movement of rocks that expose fossils



OUTCOMES: At the end of the lesson the student will:

- define index fossil
- define uplifting, overthrust, faulting
- state how fossils are exposed
- state the defining characteristic of sedimentary rock

We have recently finished writing our new paleontology curriculum. Copies are available to teachers who attend our paleontology workshop on July 27. Please join us!

BACKGROUND INFORMATION
Sedimentary rocks are layered rocks. Chemicals in rivers, lakes, and oceans precipitate particles from water. This precipitate then mixes with inorganic remains (such as shells and skeletons) of organisms. Wind, rain, and ice wear down surface rocks into bits of sand, soil, mud, pebbles, clay, and loose sediments. All these various sediments eventually pile up layer upon layer. Over time pressure exerted by the weight of the top layers compacts and cements the lower sediments to form solid rock. Younger rock is placed on older rock. Each layer captures life forms of that period in time. These preserved species are called index fossils. By observing these index fossils the geologist can determine the age of the rock.

Sandstone is a sedimentary rock made of layers of compressed and cemented sand grains. Shale is a sedimentary rock made of layers of silt and mud. Limestone is a sedimentary rock made of layers of carbonated sediments (sea life) that thrived in a warm shallow sea. Fossils can be found in any sedimentary rock, but in the Mammoth Cave area they are most typically seen in the layers of limestone.

Rock strata can stretch, bend, and break when they are subjected to heat and pressure. They are constantly worn away on the surface by wind, rain, and ice. As the rocks change, fossils become exposed.

MATERIALS NEEDED

1. Clear glass container 12" X 18"
2. Three boxes of Jell-O of contrasting colors (red, orange, green)
3. 1½ cups of Coolwhip or cottage cheese (blended)
4. ¼ - ½ cup each of carrots, nuts, pieces of apples. (Avoid candies with food coloring such as M & M's)

PROCEDURE: ACTIVITY ONE - SEDIMENTARY ROCK
Create a series of rock strata with fossils.

1. Following the directions on the box, mix a box of one color Jell-O and allow to partially set-up (follow directions for soft-set or thickened Jell-O as shown on box).
2. When partially set-up, stir in Coolwhip or blended cottage cheese to make the Jell-O opaque. Add ¼ cup sliced carrots to represent fossils. Allow to set until firm.
3. Mix a box of the second color Jell-O and when partially set, stir in Coolwhip or blended cottage cheese. Add ¼ cup nuts to represent fossils. Pour this mixture on top of the first layer of Jell-O. Allow to set until firm.
4. Mix the third box of Jell-O and when partially set, stir in Coolwhip or blended cottage cheese. Add pieces of apples to represent fossils. Pour this mixture on top of the first two layers of Jell-O. Allow to set until firm.

ACTIVITY TWO - EXTRUSION OF FOSSILS

Create movement of Jell-O that is characteristic of earth's movement to expose the fossils. Cut 4"x 4" squares of Jell-O. Use one square for each of the following demonstrations:

1. **Uplifting.** Place a four- by four-inch square of Jell-O on a plate. Slide a knife under the piece of Jell-O and gently lift. First the strata will bend and then it will break. Once the pieces are standing on end, some of the fossils may be exposed.
2. **Overthrust**. Cut another four- by four-inch square of Jell-O. Gently and evenly push in from opposite sides of the square so the center rises up and one half flops over the other half. Geologists call this overthrust. Notice the older strata is no longer under the younger strata.
3. **Faulting**. The surface of the earth is covered with cracks called faults. Sometimes the land on one side can be uplifted and raised above the land on the other side. Cut another 4" square of gelatin. Slice the gelatin into two parts. Use a spatula to raise one side. This will show the way rocks can move in relation to each other.
4. **Erosion.** Wind and rain constantly wear away sedimentary rocks, thus exposing fossils. This may be demonstrated in various ways. Allow hot water to run over a square of gelatin until fossils are exposed. Use a hair dryer to dissolve and expose the fossils in a second square.

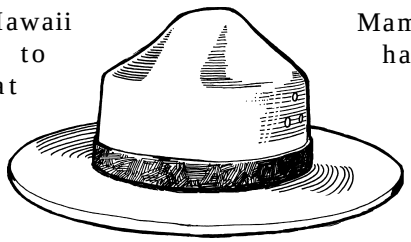
This activity adapted from *The Big Beast Book* by Jury Both

Do you know someone who would like to work in Environmental Education? We're always looking for interns!

Meet the "Earth House" Staff

Sharon Ganci, Education Specialist
Sharon is a native Kentuckian, as they say born and bred. She has been at Mammoth Cave her entire career, starting the EE program in 1970s. She loves children, reading, and wildflowers. She is married, has one son, Ryan, who is almost 13, and resides in Glasgow.

John McKay, Education Technician
John has wandered far and wide during his park service career, from Alaska to the Caribbean, from Maine to Hawaii before returning home to Kentucky to work at Mammoth Cave. Along with traditional EE duties, he is also the office "birdman."



Cheryl Messenger, Education Technician
After living overseas for 19 years, Cheryl came to the NPS with a background in Communications— writing, editing, advertising, and teaching (grades K-college). She has 2 college-aged sons, and a husband who also works at Mammoth Cave.

Zona Cetera, Education Technician
Zona's journey began in a sinkhole on a farm in Missouri. Her path took her through schools in Missouri and Illinois until she arrived at the karstlands of Kentucky. She enjoys teaching about the wonders to be found in dark places.

Heather Boothe, Education Technician
Heather grew up in San Francisco, went to college in Maine, and then returned to California to get her teaching credential. She has been working for the National Parks since 1993, and Mammoth Cave is her sixth park. She has been with us since fall of 1999.

Colleen O'Connor, Park Ranger
Colleen is a temporary employee in our office this spring, filling the position left vacant by Scott Teodorski's departure. Colleen hails from Washington state, but has been living and working at Mammoth Cave for 8 years in the Interpretive Division. Her big news: she's marrying park ecologist Rick Olson this August!

Interns
Each spring and fall we hire interns to help us out. Most are college students in a related field, but all qualified and interested people are invited to apply.

New Stuff: a classroom, microscopes, exhibits...

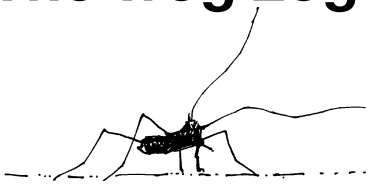
It's been rather loud in the picnic area outside the Environmental Education offices lately, but you won't find us complaining. Instead the sounds of construction remind us that by this fall we should have a brand new classroom.

This new classroom, converted from an existing picnic shelter, will serve many purposes for us: We will now have a place to do activities with students when the weather outside is inclement; students who collect water samples or engage in other scientific research in the park will now have a place to examine their samples; and we will be able to give video and slide presentations without having to displace visitors in the park's visitor center.

We're also taking some new "green" technology outside...last fall John McKay worked with volunteers to construct a boardwalk around Sloan's Crossing Pond using recycled plastic lumber. Students will now have an easier time accessing the pond for water studies, and to make their work even more interesting, we have purchased new microscopes and a solar-powered generator to supply electricity for their use.

Another exciting project is the renovation of the visitor center. This will take place in several stages, ticketing and information will be moving across the breezeway where the administrative offices are currently housed, and the current visitor center area will be converted to museum spaces with new exhibits. Construction is still to come, but authorization has been granted and the first steps have been taken!

The Trog Log



Mammoth Cave National Park
Environmental Education
PO Box 7
Mammoth Cave, KY 42259

Please share with your colleagues!